

AR48



# ANNUAL REPORT

1965



**Computing Devices**  
OF CANADA LIMITED





# FINANCIAL HIGHLIGHTS OF THE 17TH ANNUAL REPORT

	12 Months Ended September 30, 1965	9 Months Ended September 30, 1964	12 Months Ended December 31, 1963
Sales, Contracts and Other Revenue .....	\$20,176,491	\$15,208,265	\$16,892,111
Net Earnings .....	\$ 1,025,348*	\$ 1,118,427	\$ 1,587,524
Earnings per Common Share .....	\$1.32*	\$1.44	\$2.11
Common Shares Outstanding .....	775,000	775,000	750,000**
Earned Surplus .....	\$ 6,546,191	\$ 5,944,116	\$ 4,827,768
Earned Surplus per Common Share .....	\$8.45†	\$7.64†	\$6.44**
Dividends per Common Share .....	60¢	—	16¢
Common Dividends Paid .....	\$ 465,000	—	\$ 120,000
Scientific Research Expenditures .....	\$ 1,690,231	\$ 915,081	\$ 1,095,255
Outlay on Buildings and Equipment — excluding Scientific Research .....	\$ 1,237,707	\$ 563,689	\$ 1,172,630
Working Capital .....	\$ 5,047,703	\$ 3,899,842	\$ 2,536,713
Number of Employees at Year End .....	1,437	1,293	1,119
Wages and Salaries to Employees .....	\$ 8,520,600	\$ 5,423,800	\$ 6,192,700
Value of Unfilled Orders .....	\$18,200,000	\$12,300,000	\$14,900,000

\* Does not include \$100,000 of Goodwill derived from the sale of the assets of the Computer Systems operation.

\*\* Adjusted for the sub-division of the common shares on a basis of 25 for 1 in September 1964.

† After transfer of \$22,000 to Capital Surplus arising from the redemption of the 200 non-participating, cumulative, redeemable 5% preferred shares of a par value of \$100 each on October 5, 1964.

**THE COVER** — The astrolabe was an ancient navigation instrument used by the early explorers of the new world, and symbolized the spirit of the early Renaissance. We have adopted the Astrolabe as a symbol of the spirit of the new Renaissance — the rebirth of the Age of Scientific Discovery. Man has navigated every region of the earth, and now stands poised to explore the infinite reaches of space.

JAN 16 1967

The seventeenth Annual Report of *Computing Devices of Canada Limited* covering the operations and the financial results of your Company for the year ended September 30, 1965 is submitted on behalf of your Board of Directors. The consolidated financial statements of your Company and its wholly-owned subsidiary in the United Kingdom, *Computing Devices Company Limited*, for the year ended September 30, 1965 together with the report of the auditors, John Cross & Partners, are included in this report.

#### REVENUE —

As will be noted from a review of the summary of operations contained in the annexed financial statement, the Company produced a gross revenue volume in the fiscal period under review amounting to \$20,176,491, which volume is the largest experienced in the history of the Company and reflects an increase of close to \$5,000,000 over the volume for the nine months ended September 30, 1964.

Export sales and revenues represented 29% of total gross revenue and approximately one-third of total sales was to non-military customers.

#### NET PROFIT —

The net profit, after taxes and all charges, was \$1,025,348, equal to \$1.32 per common share outstanding, as against a net profit for the nine months ended September 30, 1964 of \$1,118,427, equal to \$1.44 per share.

This reduction in earnings of twelve cents (0.12) per share can be attributed to royalty income and research expenditures and does not, therefore, reflect the full accomplishment of the Company in the past year.

#### ROYALTY INCOME —

Our royalty income for the year, before taxes, was

\$162,297, which was \$413,297, or fifty-three cents (0.53) per share, lower than the corresponding revenue in the previous nine months fiscal period. This, as indicated in the interim report of June 28, 1965, is due to the decline in production of products manufactured by licensees abroad, but, we hope that as new products are introduced the revenues from this source will increase in future years.

#### RESEARCH —

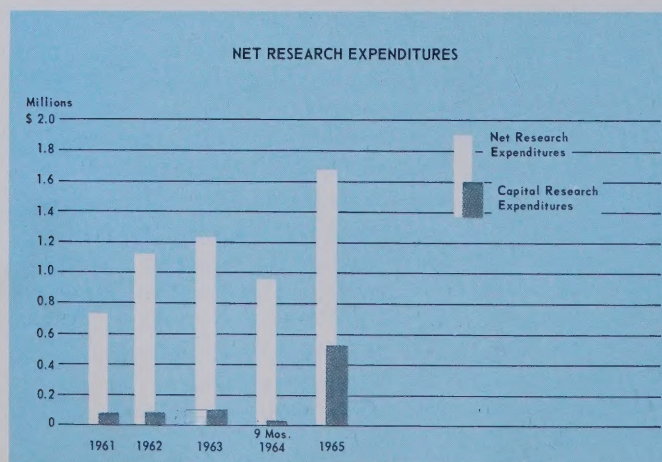
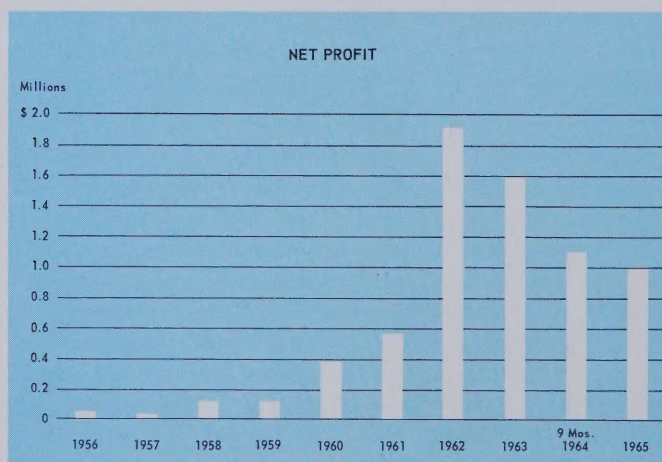
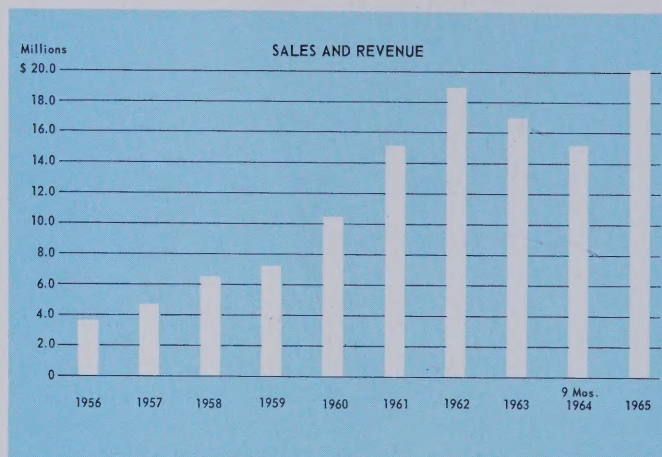
During the 1965 fiscal period, the Company increased its activities in the research, development and engineering of a number of new products. The Company considered it necessary to maintain its research and development effort at a high level in view of the rapid technological and scientific advances being made in its fields of interest. Our efforts should result in the Company continuing to have an expanding range of advanced products available for acceptance in world markets.

Such a policy entails the expenditure of large sums of money on research and development and in the year under review the Company's outlays on all research and development programs, buildings and equipment, less recoveries, amounted to \$1,690,231 which expenditure was \$775,150 greater than that incurred in the fiscal period ended September 30, 1964.

Included in the research expenditures for the year is the net amount of \$1,162,842 expended for the purpose of carrying out various current research, design and development programs. Also included was the total of \$527,389 spent on assets of a capital nature. This latter amount included the expenditures on the new Research and Development Building, now under construction on our property at Bells Corners, Ontario, charged to operations in the year ended September 30, 1965 amounting to \$224,477. The remaining

*Continued overleaf*





\$302,912 of capital expenditures on research in the 1964/65 fiscal year were incurred in the acquisition of other scientific research equipment and facilities including an aircraft costing \$70,256 to be fitted for flight testing and evaluation of product models and prototypes.

Therefore, it will be readily appreciated that the total amount of \$1,690,231 written off in the past fiscal year on research and development for the future advantage of the Company was equal to \$2.18 per share before taxes. However, what is not so apparent is that included in this amount were capital assets of long term value acquired by the Company totalling \$527,389, equal to sixty-eight cents (0.68) per share before taxes.

The balance of the cost of our new Research and Development Building, amounting to approximately \$875,000, will arise in the fiscal year ending September 30, 1966. Consideration will be given during the year to determine how much of this amount will be written off against operations in order to ensure that we obtain maximum advantage of the income tax provisions covering capital expenditures on research and development.

Since the introduction of the income tax incentives on scientific research, effective in the fiscal year 1961, your Company has expended and charged to earnings approximately \$5,500,000. Of this amount, \$813,000 was expended on research capital facilities and equipment which have been fully amortized on the books of the Company.

All of these expenditures have qualified, or do qualify, we believe, for the special incentives which have provided substantial tax savings, and thus permitted your Company to undertake research programs and expand our research facilities to an extent which might not have otherwise been possible.

#### AGENCY SALES OPERATION -

The Company has supplemented the sale of its own products for many years by acting as Canadian sales representative for a number of manufacturers in the United States of America, the United Kingdom and other countries. This aspect of our business was oper-



ated under four sales and service units, namely, Marine, Avionics, Computer Systems and Technical Products.

The Computer Systems operation of the Company has, since June 7, 1963, been concerned solely with the exclusive representation in Canada for the sale, leasing and servicing of the products of Control Data Corporation, U.S.A.

Control Data Corporation, however, in line with its current policy of conducting its own domestic and foreign operations, rather than using local agents or representatives, advised your Company of its intention to appoint its subsidiary, Control Data Canada, Ltd., to assume exclusive responsibility for all Control Data products in Canada.

Accordingly, Control Data Canada, Ltd., entered into and concluded negotiations with your Company to purchase, as at September 30, 1965, all of the assets and liabilities related to our Computer Systems operation. As a result, Control Data Canada Ltd., acquired the services of fifty-three employees of our Computer Systems operation, together with assets and liabilities having a net value of \$1,686,552.14, including \$100,000 for goodwill.

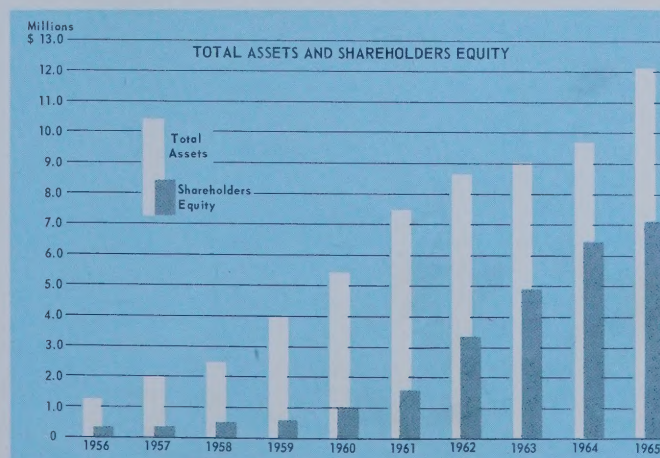
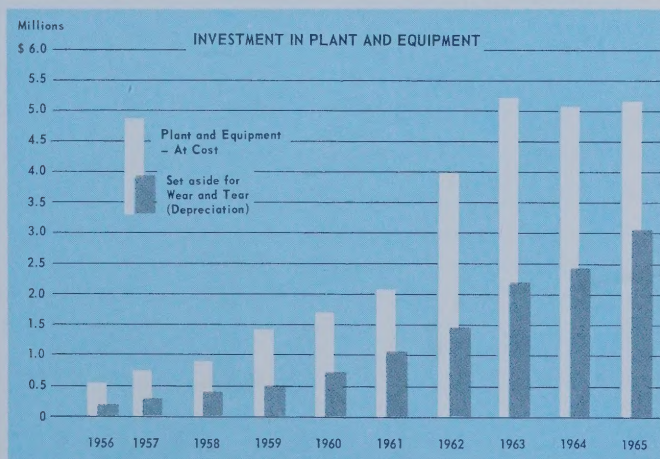
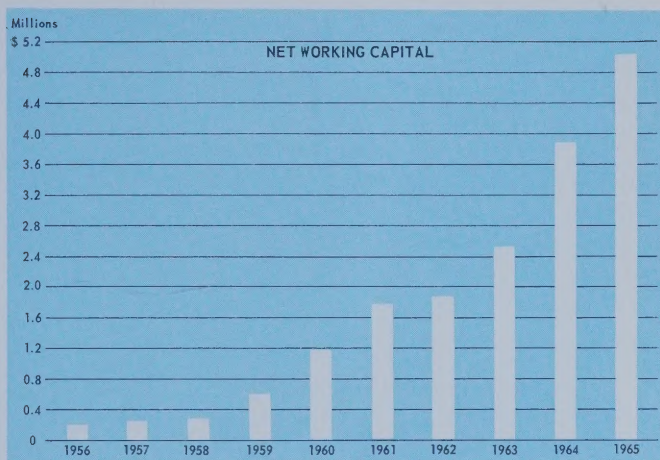
If this transaction had not been undertaken, your Company would not have received \$100,000 for goodwill, and the earnings per share, after taxes, would have been approximately nine cents (0.09) per share lower than the reported earnings of \$1.32 per share.

With the sale of these fixed assets and inventories the Company will now have available substantial funds which were formerly invested in computers and computer equipment on lease to various customers.

#### U.K. SUBSIDIARY -

The Company's subsidiary in the United Kingdom continued its pioneering program during the past year and incurred a deficit of \$99,833 which has been absorbed in the overall consolidated result. It now appears that our efforts in establishing this wholly-owned subsidiary in England are beginning to show results. Several contracts recently obtained

*Continued overleaf*





by that company provide every indication that a turn to profitable operations will take place in the current year.

#### VALUE OF UNFILLED ORDERS -

Your Company in the past year has been successful in its efforts to expand its domestic and worldwide markets. At fiscal year-end the value of unfilled orders reached its highest point in the Company's history, \$18,200,000 as against \$12,300,000 at September 30, 1964

#### SURPLUS AND DIVIDENDS -

As a result of the year's operations the consolidated earned surplus increased by the net amount of \$602,075 to \$6,546,191 or \$8.45 per share.

Dividends totalling sixty cents (0.60) per share were declared by your Directors during the year and were paid at the rate of thirty cents (0.30) per share in January and July, 1965.

Your Directors recently declared a dividend of thirty cents (0.30) per share payable January 26, 1966 to shareholders of record on January 5, 1966.

#### WORKING CAPITAL -

The net working capital increased by \$1,147,861 during the year to a total of \$5,047,703 at September 30, 1965.

#### CAPITAL STOCK AND SHAREHOLDERS' EQUITY -

The total assets of the Company increased during the year by \$2,407,889 to \$12,176,126 as at September 30, 1965 and the common shareholders' equity as at that date amounted to \$7,068,494 or \$9.12 per share. This represented an increase of seventy-eight cents (0.78) per common share during the year.

The 200 non-participating cumulative redeemable 5% preference shares of a par value of \$100 each, were all redeemed and cancelled by the Company on October 5, 1964. The shares, in accordance with the terms thereof, were redeemed at \$110.00 each and as required by Section 61 of the Companies Act (Canada), as then in force, the Company, as of that date, transferred the amount of \$22,000, being the redemption price of the shares, from the Earned Surplus account to a Capital Surplus account.

In this connection, a By-law will be presented at the forthcoming annual meeting of the shareholders pursuant to which the Capital Surplus will be transferred back to Earned Surplus as provided for in the Canada Corporations Act.

#### DIRECTORS -

During September 1965, Mr. Malcolm P. Ferguson and Mr. George E. Stoll tendered to the Board their resignations as directors of your Company. The resignations were accepted with extreme regret.

Mr. M.P. Ferguson served for many years as President of The Bendix Corporation until his new appointment as Chairman of the Finance Committee this year.

Mr. G.E. Stoll was for a number of years an Executive Vice-President of The Bendix Corporation until his election as President and Chief Operating Officer earlier this year.

Mr. Ferguson and Mr. Stoll had been directors of your Company for over nine years during which time they provided guidance, inspiration, and valuable assistance to your Board of Directors.

To fill the two vacancies on the Board until the next annual general meeting of shareholders, your directors appointed Mr. A.P. Fontaine, Chairman and Chief Executive Officer of The Bendix Corporation, and Mr. J.B. Treacy, Executive Director, Foreign Aerospace and Industrial Affiliates, for International Operations of The Bendix Corporation.

#### ACKNOWLEDGEMENTS -

The Directors join with me in acknowledging the very great contribution made by all of the employees and to express our appreciation and thanks for their skill, effort and loyalty during the past year.

In addition, we wish to record our sincere appreciation to our shareholders for their interest and support.

ON BEHALF OF THE BOARD



C.F. Hembery  
President and General Manager

*The pages following the financial portion of this report have been reprinted from a current Company brochure to provide you with an outline of the Company, its products and services.*



## AUDITORS' REPORT

To the Shareholders,  
Computing Devices of Canada Limited.

We have examined the consolidated balance sheet of *Computing Devices of Canada Limited*, and its wholly-owned British subsidiary as at September 30, 1965 and the statements of consolidated income and surplus for the year ended on that date and have obtained all the information and explanations we have required. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances. In the case of the wholly-owned British subsidiary, we have relied on the report of another firm of Chartered Accountants.

We wish to report that the partners of our firm hold a collective holding of 460 shares of the Company's issued capital stock.

In our opinion and according to the best of our information and the explanations given to us, and as shown by the books of the Companies, the accompanying consolidated balance sheet and statements of consolidated income and surplus are properly drawn up so as to exhibit a true and correct view of the affairs of the Companies as at September 30, 1965, and the results of their operations for the year ended on that date, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Our examination also included the accompanying consolidated statement of source and application of funds which, in our opinion, when considered in relation to the aforementioned financial statements, presents fairly the sources and applications of funds of the Companies for the year ended September 30, 1965.

JOHN CROSS & PARTNERS  
Chartered Accountants.

OTTAWA, Ontario,  
November 10, 1965.

## CONSOLIDATED COMPARATIVE BALANCE SHEET

As at September 30, 1965 and 1964

ASSETS	1965	1964
CURRENT:		
Cash on hand .....	\$ 4,188	\$ 3,825
Accounts and amounts receivable, trade <i>(Less allowance for doubtful accounts, 1965 - \$9,626, 1964 - \$16,741)</i> .....	4,037,318	3,910,897
Overpayment of income taxes refundable .....	59,154	
Due from Control Data Corporation under Agreement of Sale .....	1,586,552	
Miscellaneous deposits, advances and deferred charges .....	332,387	319,267
Inventories, valued at the lower of cost or market, based on physical count and cost records:		
Finished goods .....	390,126	462,545
Work in process .....	3,230,401	1,962,625
Materials .....	226,766	212,345
TOTAL CURRENT ASSETS .....	9,866,892	6,871,504
FIXED - at cost:		
Land .....	69,844	69,844
Buildings, general .....	61,574	61,574
Equipment, general .....	4,062,672	4,499,140
Leasehold improvements .....	193,961	189,442
Aerophysics research facility .....	395,179	286,045
Aircraft .....	70,256	
Research building .....	224,477	
Research equipment .....	123,523	
	5,201,486	5,106,045
Less: Accumulated depreciation .....	3,067,435	2,448,292
Net book value .....	2,134,051	2,657,753
Deferred development expenses, including tooling, jigs and fixtures .....	175,183	238,980
	\$12,176,126	\$9,768,237

APPROVED ON BEHALF OF THE BOARD OF DIRECTORS

C.F. HEMBERY, Director

J.A. NORTON, Director



## CONSOLIDATED COMPARATIVE BALANCE SHEET

As at September 30, 1965 and 1964

## LIABILITIES AND SHAREHOLDERS' EQUITY

	1965	1964
<b>CURRENT:</b>		
Bank loans and overdraft secured .....	\$ 1,799,672	\$ 817,824
Accounts payable and accrued charges .....	1,575,390	863,220
Income, sales and other taxes payable .....	192,255	195,632
Deferred contract revenue .....	1,251,872	1,094,986
<b>TOTAL CURRENT LIABILITIES</b> .....	<b>4,819,189</b>	<b>2,971,662</b>
<b>DEFERRED CREDIT:</b>		
Accumulated tax reductions applicable to future years .....	232,730	275,575
<b>DEFERRED LIABILITY:</b>		
Mortgage payable, C.M.H.C. 6½% due November 1, 1987 .....	55,713	56,581
	<b>288,443</b>	<b>332,156</b>
<b>SHAREHOLDERS' EQUITY:</b>		
<b>CAPITAL STOCK:</b>		
Authorized:		
200 non-participating, cumulative, redeemable 5% preferred shares, par value \$100.00 each		
Less:		
200 shares redeemed during the year ended September 30, 1965 for cash		
1,500,000 common shares of no par value, consideration not to exceed \$5,000,000.00		
Issued and Fully Paid	Number of Shares	
Preferred .....	200	20,000
Less: Shares redeemed .....	(200)	(20,000)
Common .....	775,000	500,303
	500,303	520,303
<b>EARNED SURPLUS – (Refer to statement of earned surplus) .....</b>	<b>6,546,191</b>	<b>5,944,116</b>
<b>CAPITAL SURPLUS – arising from the redemption of preferred shares, as required under Section 61 of the Dominion Companies Act – (Refer to statement of capital surplus) .....</b>	<b>22,000</b>	
	<b>7,068,494</b>	<b>6,464,419</b>
	<b>\$12,176,126</b>	<b>\$ 9,768,237</b>

This is the balance sheet referred to in our report to the Shareholders dated November 10, 1965.

JOHN CROSS &amp; PARTNERS

Chartered Accountants.



**CONSOLIDATED COMPARATIVE STATEMENT OF EARNED SURPLUS**

For the fiscal periods ended September 30, 1965 and September 30, 1964

	12 Months Ended September 30, 1965	9 Months Ended September 30, 1964
Balance at beginning of period .....	\$ 5,944,116	\$ 4,827,768
ADD:		
Capital gains arising from the disposal of fixed assets .....	498	2,927
Goodwill on sale of Computer Division to Control Data Corporation Ltd. ....	100,000	
Net profit for the year ( <i>Refer to statement of profit and loss</i> ) .....	1,025,348	1,118,427
	<u>7,069,962</u>	<u>5,949,122</u>
DEDUCT:		
Adjustment of prior years' income taxes — Net .....	31,721	3,712
Fee in connection with application for supplementary letters patent .....		1,294
Listing fee — Toronto Stock Exchange .....	3,050	
Premium paid on redemption of preferred shares .....	2,000	
Transfer to capital surplus arising on redemption of preferred shares .....	22,000	
Dividends declared on common stock .....	465,000	
	<u>523,771</u>	<u>5,006</u>
Balance at end of period .....	<u>\$ 6,546,191</u>	<u>\$ 5,944,116</u>

**CONSOLIDATED COMPARATIVE STATEMENT OF CAPITAL SURPLUS**

For the fiscal periods ended September 30, 1965 and September 30, 1964

	12 Months Ended September 30, 1965
Appropriation from earned surplus arising from the redemption of preferred shares as required under Section 61 of the Dominion Companies Act .....	\$ 22,000
Balance at end of period .....	<u>\$ 22,000</u>



**CONSOLIDATED COMPARATIVE STATEMENT OF PROFIT AND LOSS**

For the fiscal periods ended September 30, 1965 and September 30, 1964

	12 Months Ended September 30, 1965	9 Months Ended September 30, 1964
Sales, contract and other revenue .....	\$20,014,194	\$14,632,671
Royalty revenue .....	162,297	575,594
Total sales, contract, royalty and other revenue .....	20,176,491	15,208,265
Net revenue before taking into account the following expenses .....	3,413,258	2,978,212
Directors' fees .....	3,050	1,761
Remuneration to Directors and Executive Officers .....	194,423	156,615
Interest on long-term debt .....	3,837	8,943
Legal fees .....	8,132	1,381
Research and development expenses .....	1,088,774	644,676
Provision for depreciation and amortization:		
Buildings and equipment, general .....	498,144	442,823
Engineering research building and equipment .....	348,000	
Aerophysics building and equipment .....	109,133	23,121
Aircraft .....	70,256	
	2,323,749	1,279,320
NET PROFIT BEFORE PROVISION FOR INCOME TAXES .....	1,089,509	1,698,892
Provision for Federal and Provincial income taxes .....	107,006	589,404
DEDUCT:		
Tax increase in respect of deferred depreciation in prior years (Note A) .....	42,845	8,939
	64,161	580,465
NET PROFIT TO SURPLUS – (Refer to statement of earned surplus) .....	\$ 1,025,348	\$ 1,118,427
Common shares outstanding .....	775,000	775,000
Earnings per common share .....	\$ 1.32	\$ 1.44

**NOTE A:** The amount of depreciation claimed for tax purposes in the years prior to 1964 exceeded recorded depreciation by \$547,141 giving rise to a tax reduction of \$284,514. In 1964 and 1965 the recorded depreciation and patent costs expensed exceeded that claimed for tax purposes by \$17,190 and \$82,393 respectively. As a result, transfers were made from the deferred taxes account to taxes payable of \$8,939 for 1964 and \$42,845 for 1965, as shown by this statement and as reflected in the balance sheet.



**CONSOLIDATED STATEMENT OF FINANCIAL CONDITION**

As at September 30, 1965, September 30, 1964 and December 31, 1963

	September 30, 1965	September 30, 1964	December 31, 1963
<b>CURRENT ASSETS:</b>			
Cash on hand .....	\$ 4,188	\$ 3,825	\$ 3,074
Accounts and amounts receivable, trade ....	4,037,318	3,910,897	2,111,687
Overpayment of income taxes, refundable ..	59,154		
Due from Control Data Corporation under Agreement of Sale .....	1,586,552		
Miscellaneous deposits, advances and deferred charges .....	332,387	319,267	374,366
Inventories .....	3,847,293	2,637,515	3,359,797
	<u>9,866,892</u>	<u>6,871,504</u>	<u>5,848,924</u>
<b>CURRENT DEBT:</b>			
Due to bank .....	1,799,672	817,824	954,908
Accounts payable and accruals .....	1,575,390	863,220	1,062,660
Income, sales and other taxes payable .....	192,255	195,632	204,902
Deferred contract revenue .....	1,251,872	1,094,986	1,089,741
	<u>4,819,189</u>	<u>2,971,662</u>	<u>3,312,211</u>
Working capital .....	5,047,703	3,899,842	2,536,713
Increase in working capital .....		1,147,861	1,363,129
	<u>\$ 5,047,703</u>	<u>\$ 5,047,703</u>	<u>\$ 3,899,842</u>



**CONSOLIDATED COMPARATIVE SOURCE AND APPLICATION OF FUNDS**

For the fiscal periods ended September 30, 1965 and September 30, 1964

	12 Months Ended September 30, 1965	9 Months Ended September 30, 1964
<b>SOURCE: (FUNDS CAME FROM)</b>		
Net profit for the year .....	\$ 1,025,348	\$ 1,118,427
Add: Expenses not requiring cash outlay:		
Depreciation .....	1,025,533	465,944
Development costs absorbed .....	98,307	36,150
	1,123,840	502,094
Less: Tax increase in respect of deferred depreciation in prior years .....	42,845	8,939
	1,080,995	493,155
	2,106,343	1,611,582
Goodwill on sale of Computer Division .....	100,000	
Issue of common shares .....		500,000
Disposal of fixed assets .....	1,263,265	527,725
Capital gains from disposal of fixed assets .....	498	2,927
	3,470,106	2,642,234
<b>APPLICATION: (FUNDS WERE SPENT FOR)</b>		
Development costs deferred .....	34,510	146,561
Purchases of fixed assets .....	1,765,096	586,810
Repayment of advances from affiliated companies .....		480,000
Repayment of advances from Shareholders .....		60,000
Repayment of C.M.H.C. mortgages .....	868	728
Adjustment of prior years' income taxes — Federal .....	25,808	2,468
— Ontario .....	5,816	1,244
— Quebec .....	97	
Fee in connection with application for Supplementary Letters Patent .....		1,294
Toronto Stock Exchange listing fee .....	3,050	
Redemption of preferred shares .....	20,000	
Premium on redemption of preferred shares .....	2,000	
Dividends paid .....	465,000	
	2,322,245	1,279,105
	\$ 1,147,861	\$ 1,363,129

# COMPUTING DEVICES OF CANADA LIMITED

## DIRECTORS:

A.P. Fontaine, Detroit, Michigan, U.S.A.  
Charles F. Hembery, Ottawa, Ontario, Canada  
Joseph A. Norton, Ottawa, Ontario, Canada  
L. Edwin Smart, New York, N.Y., U.S.A.  
George L. Stephens, Ottawa, Ontario, Canada  
J. Frederick Taylor, Toronto, Ontario, Canada  
James B. Treacy, New York, N.Y., U.S.A.

## OFFICERS:

Charles F. Hembery, President and General Manager  
Joseph A. Norton, Vice-President – Research and Engineering  
James E. Smith Jr., Vice-President – Marketing and Space Sciences  
Cecil K. Wolff, Vice-President – Finance and Administration  
Charles R. Grove, Secretary

## OFFICES:

*Head Office and Plant* – Bells Corners, Ontario  
*Sales Offices* – Ottawa, Toronto, Ont.; Montreal, Que.;  
Halifax, N.S.; Washington (U.S.A.)  
Los Angeles (U.S.A.)  
*Service Depots* – Montreal, Que., Halifax, Lunenburg, Sydney and  
Yarmouth, N.S., Burin and Grand Bank, Nfld.

## SUBSIDIARY COMPANY:

Computing Devices Company Limited,  
London, England

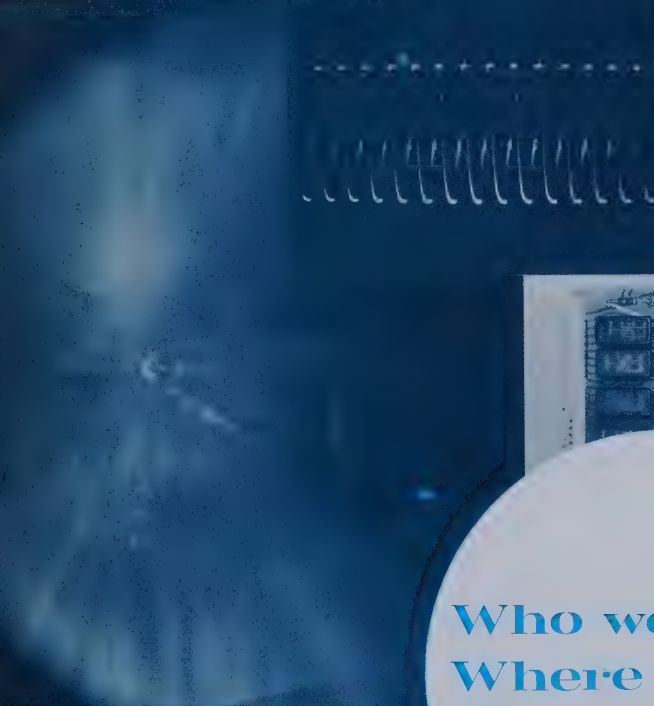
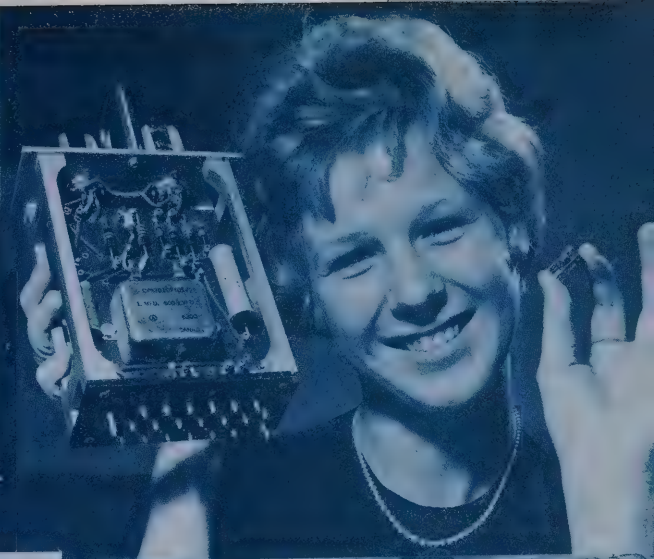
## REGISTER AND TRANSFER AGENT:

Canada Permanent Trust Company –  
Toronto and Montreal

## AUDITORS:

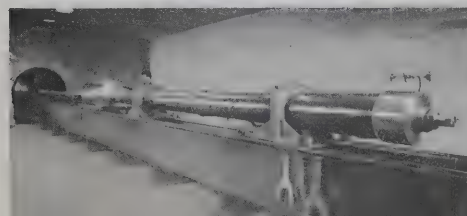
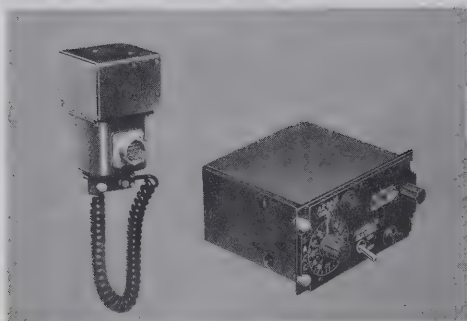
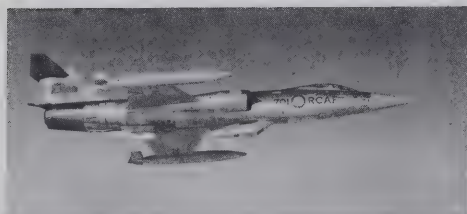
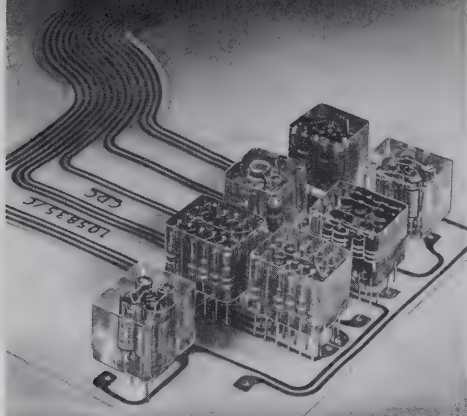
John Cross & Partners  
Ottawa, Ontario





Who we are...  
Where we are...  
What we do...





## WHO WE ARE ...

### A Brief Description

*Computing Devices* is the largest industrial Company in the Ontario sector of greater Ottawa. Over a third of our 1500 staff are scientists, engineers and technologists. The main plant contains 260,000 square feet of modern office, manufacturing, research and development and laboratory space, including a new Research and Development building of 63,000 square feet. An Administration and Research Laboratory building was recently erected to augment the existing range and laboratory facilities on our 400 acre site at nearby Stittsville to provide much needed room for the expanding activities of the Space Sciences Division of the Company.

Sales have grown sharply from just over \$40,000 in 1948 to over \$20 million in 1965, and continuing growth is anticipated in future years. Export sales play an important part, with about one-third of all products being exported to other countries.

In 1956 *Computing Devices* became affiliated with the Bendix Corporation. In addition to having provided financial assistance, this association has enabled the Company to market and manufacture under license in Canada a wide range of avionic and computer products as well as advanced scientific instruments and systems.

To strengthen our engineering support to British and European governments and industries, the Company established a British subsidiary in 1962. This organization has access to all facilities of the parent Company and, with its own staff, provides an effective extension of our overall engineering team.

In 1964 the Company changed from a private to a public company and its shares are listed for trading on the Toronto Stock Exchange.

Finally, our most important asset – the people of *Computing Devices*. It is their enthusiasm, professional competence and integrity that has made *Computing Devices*' growth possible. It is their dedication to their craft that will make *Computing Devices*' future growth assured.



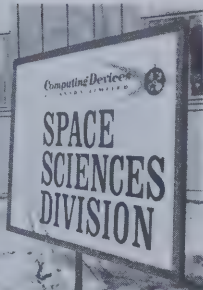
# WHERE WE ARE ...



Our Main Plant at Bells Corners



Our Space Science Research Laboratory and Administration Building



Our new Research and Development Building — also at Bells Corners



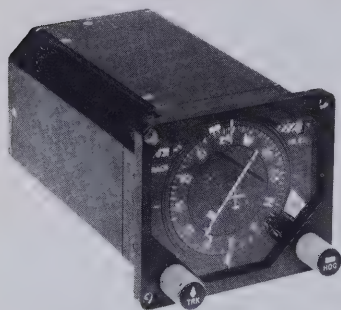
## Product Objectives

From our first project in 1948 – a study contract on digital techniques applied to simulation – our Company has made tremendous strides in the development and application of digital data processing and electronic computers. We are presently preparing to manufacture the AN/UYK-501, an advanced, miniaturized computer of our own design, for ground, air and marine applications.

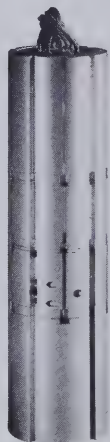
One of our major activities has been the design, development and manufacture of air navigation systems. An outstanding success has been the well-known series of Position and Homing Indicator (PHI) navigation systems for single-seat fighter aircraft. Over 3,000 systems have now been manufactured and shipped to the air forces of 12 nations. The latest of the PHI series, the PHI 10B, spans the speed spectrum from helicopters to supersonic aircraft.

To provide the most accurate navigational and tactical information to aircrew members, the Company has developed a number of advanced electro-mechanical and electronic displays.

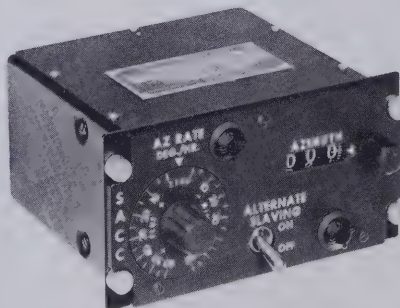
The Integrated Display of Situation (IDS) has been ordered in substantial



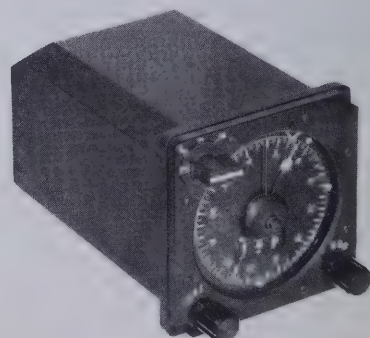
Integrated Display of Situation



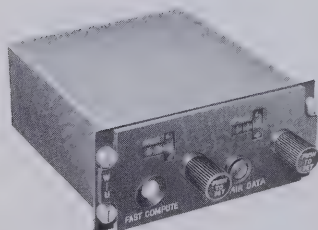
High "g" Telemetry



Synchronous Astro Compass Controller



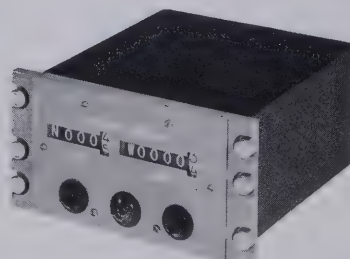
PHI 5C Indicator Unit



Automatic Wind Computer System (Wind Unit)



PHI 10B  
Position and Destination Display



Spherical Data System  
(Display Unit)



GAINS  
Lat/Long Computer



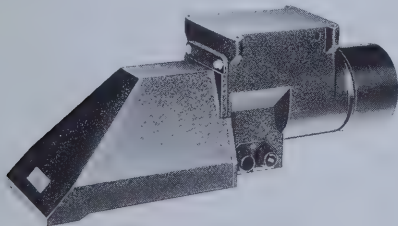
Company Aircraft



quantities for the RCAF. The TopoMap™ Moving Map Display has been developed in both military and civil airline versions. The Spectocom Head-Up Display and the Tactical Display System, have broad applications to many types of military aircraft.

Photo-optical work, deriving from earlier missile flight trials, led to the development of an automatic, multi-camera photo-reconnaissance system now installed on the RCAF's CF-104 supersonic fighters. This technology is giving way to more advanced electro-optical techniques and an airborne infra-red fire detection system has now been successfully flight evaluated.

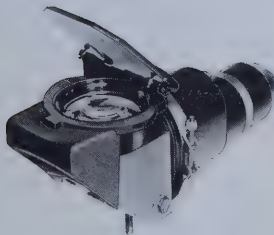
The products shown here are representative of the product objectives of *Computing Devices*. Over the years, the range of application of the Company's products has widened from navigation through anti-submarine warfare to signal processing and command and control on a broad level. New areas are constantly under study and with them the challenge of a technology whose frontier is being pushed back more rapidly than any other the world has ever known.



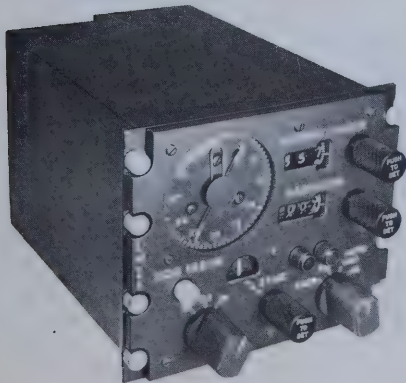
Tactical Display System Unit



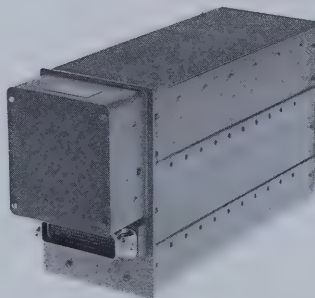
TopoMap™ Moving Map Display



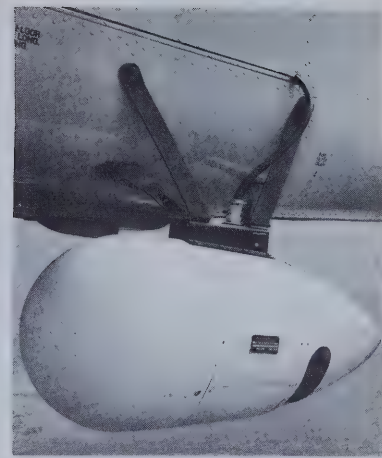
Head Up Display Unit



Central Heading System Indicator



AN/UYS-501 Digital Computer



Airborne Fire Detector System

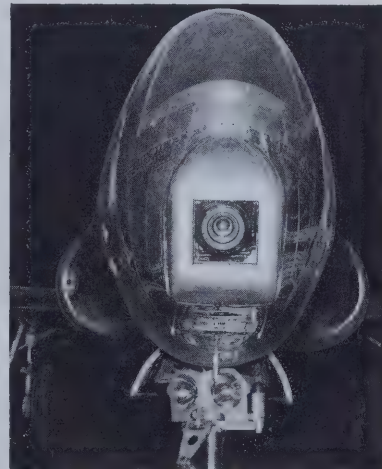


Photo Reconnaissance System



PHI™-tel Communications Equipment



Stereo-microscope used for microcircuit fabrication.

## Research & Development

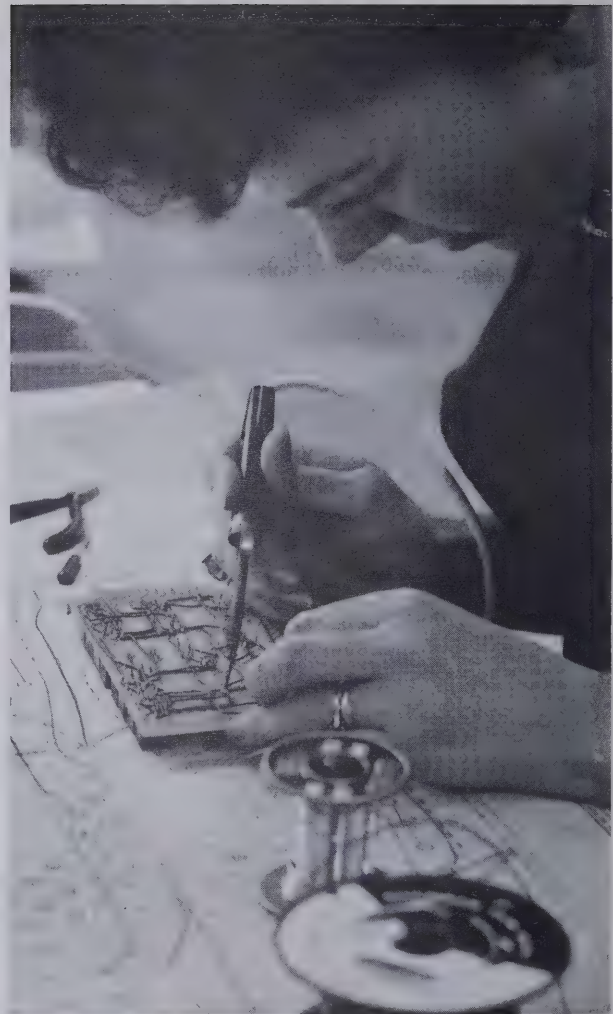
Much of the success of *Computing Devices'* products lies in the intensive preparatory studies which precede the design of each component or system. These studies give our scientists and engineers a thorough understanding of the role the equipment is to fill, and an awareness of the user's needs in the field. This anticipation of future technical and operational requirements results in the highly advanced design ideas characteristic of *Computing Devices* products.

**Our Research and Development Division is divided into three branches; Development, Applied Science and Advanced Studies.**

**The Development Branch** concentrates on new products and on those devices and techniques which are destined to become part of new products. Currently work is being applied to new digital computers, digital devices, analog-to-digital and digital-to-analog interfaces. Hybrid display methods and unconventional servos are being studied; also new ideas relating to high-density packaging.

**The Applied Science Branch** has been looking into such things as integrated circuits, very compact memories, and laser techniques. It is the task of this group to bring new skills and disciplines into the Company and establish a basic reservoir of knowledge on which a complete technical structure can be built. As a consequence, the center of interest of the Applied Science Branch shifts with the appearance of new advances in technology.

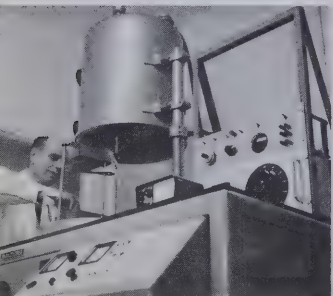
**The Advanced Studies Branch** undertake computer programming, mathematical studies and operations research. Members of this group were responsible for the design of the software system of *Computing Devices'* general purpose digital computer, the AN/UYK-501. The Company's



Soldering printed circuit board connections for a service test model.

Control Data G-20 computer is used by Advanced Studies for Monte Carlo problems, Games Theory Studies, and the simulation of proposed data processors.

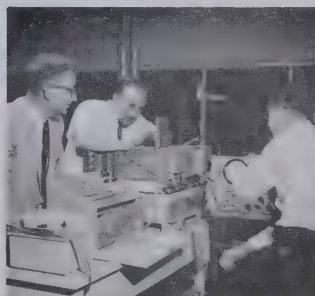
"Explorations" is the watchword of *Computing Devices* and nowhere is the spirit of explorations more clearly exemplified than in its research and development.



Vacuum deposition equipment



Engineers checking out computer circuitry.



Test procedure on a solid state computer.



Inspection lens viewpoint of a memory core array.





The engineering laboratory works to meet a schedule.

## Engineering

Our Engineering Division, assisted by R and D, applies its extensive resources to meet the military product requirements of our customers. From each initial new system study, the creative talents of our Engineers are applied towards a single goal – the development of products which will continue to uphold the Company's leading position in its field. Step by step, the exacting requirements of each customer's specification are incorporated into designs as they proceed through successive engineering phases toward the evaluation of a proven production prototype.

Systems Engineers, in consultation with Marketing Group, examine customer requirements and prepare technical proposals which outline the system concept. The proposal may simply be for the modification of existing equipment, or more frequently for a new design using extensions of our technology combined with new art created by our Research Engineers. When proposal activity is complete the system engineers specify the product to be developed to satisfy the customers needs.

The Project Engineers and their teams, which carry out the actual development, are responsible for programs involving a wide variety of complex computing and display equipment. They involve electronic and circuit design using both analog and digital techniques. Engineers specializing in the analog field have designed and developed such successful products as the Position and Homing Indicators (PHI) series now used throughout the world, and the unique Moving Map Display, which shows an aircraft pilot his exact position on a moving map background. Engineers specializing in digital techniques have completed the checkout of development models of the AN/UYK-501 Digital Computer and are in the advanced stages of design and fabrication of four different digital computing

systems for air, sea and land applications. They are now completing the final design modifications prior to releasing two of these to production.

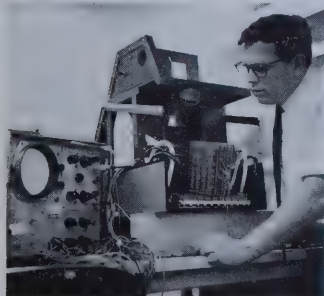
The mechanical design of products to meet the stringent environmental conditions which will be encountered by the equipment is a task for specialists. Our mechanical engineers, designers and draftsmen work closely with those responsible for the electronic design. They are supported by a team which specializes in component selection specifications and reliability analysis.

Test models are constructed in our well equipped Engineering Laboratories and Model Shop to prove equipment designs. Experimental and test work to verify theoretical calculations is also carried out using these facilities.

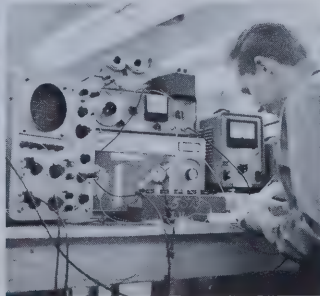
The efficiency of an engineering staff lies in their freedom to create engineering designs unhampered by administrative problems. Every effort is made to reduce unnecessary and time-consuming functions – thus allowing the engineer to utilize his most valuable asset – the practical application of his creative abilities.



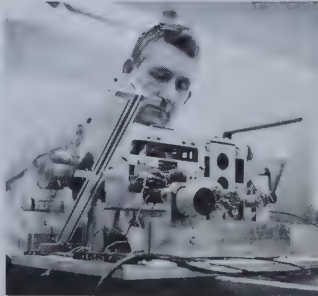
Printed Circuit Board layouts are an important part of product design department work.



Checkout of the digital logic of a display console.



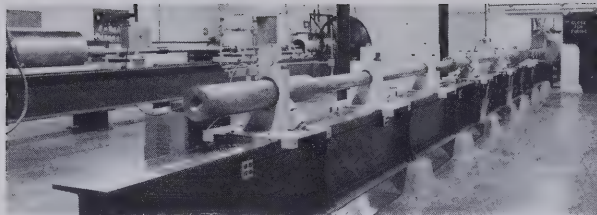
Breadboard circuit performance is tested at high (+71°C) and low (-55°C) temperatures.



A digital servo breadboard in checkout.



Drafting Department



Hypervelocity Gas Gun Facility

## Space Sciences

Our Space Sciences Division is engaged in one of the most challenging of today's problems – the investigation of aerospace science and technology. In addition to the general fields of mathematics, physics and engineering, the scientists of this division probe into such specialized areas as aerodynamics, impact physics, gas dynamics, thermodynamics and solid state physics.

The major research tools of the Space Sciences Division are high-speed digital computers and the aeroballistic ranges. The ranges are located on a 400 acre site at Stittsville, a few miles from the Company's main plant, and contain a half-inch light gas gun with a launch velocity of 30,000 feet-per-second, and a 1½ inch light gas gun with a launch velocity of 20,000 feet-per-second. These guns operate in controlled, atmosphere-free ranges which simulate conditions in space. The Company also owns and operates a four-inch, 7,000 feet-per-second smooth-bore powder gun, a twelve inch, 2,000 feet-per-second compressed air gun, and a number of conventional small arms ranges.

The principal scientific and development studies are Impact Physics, Aerodynamics and Re-Entry Physics, High "g" Telemetry, Hypervelocity Simulation Facilities and Scientific Services.

**Impact Studies.** Typical of the scientific and technical areas being investigated are:

- The study of damage caused on impact with a target by projectiles of different shapes and speeds.
- The design and evaluation of meteoroid protection systems for space vehicles.
- The phenomenon of intense light caused by hypervelocity impact.
- Impact damage on the materials of aircraft and surface

vehicles resulting from limited warfare situations.

**Aerodynamics and Re-Entry Physics.** The major areas of investigation are vehicle flight dynamics, blast effects, and re-entry phenomena by aeroballistic free flight testing techniques.

**High 'g' Telemetry.** High 'g' telemetry units are being developed for such applications as aeroballistic range, gun-launched upper atmosphere research vehicles, high-acceleration rockets and missiles and hard landing instrumentation.

**Hypervelocity Simulation Facilities and Techniques.** We are presently undertaking the development of high performance ballistic range facilities, associated range instrumentation and ballistic range techniques. Studies are also underway to develop new internal ballistic calculation systems for conventional guns and special launchers such as light gas guns.

**Scientific Services.** The Space Sciences Division supports a number of agencies in the management, operation and maintenance of the following special facilities:

- Operation, maintenance and data analysis of Canadian Government space satellite tracking stations.
- Scientific and technical support of the joint US (ARPA) – Canadian (DRB) cooperative Aerophysics Research program at the Canadian Armament Research and Development Establishment.
- Management, maintenance and operation of the joint McGill University – US Army Project HARP Barbados facility.
- Operation of the data processing and analysis center at Cold Lake for the Air Armament Evaluation Detachment of the Royal Canadian Air Force.

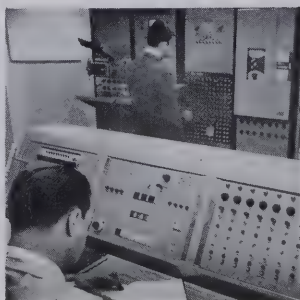
The Space Sciences Division is a rapidly expanding unit of *Computing Devices*. Backed by ten years of experience, its scientists and engineers are proud of their role in the new and exciting age of space.



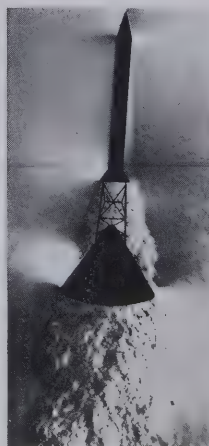
Controlled Atmosphere Range



Satellite Telemetry Station at DRTE



Control room instrumentation for ballistic range experiment.

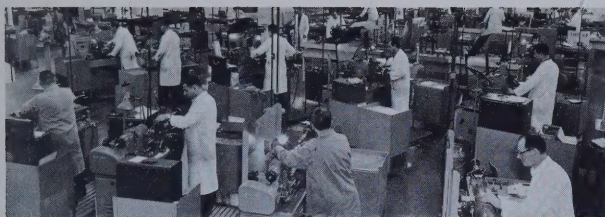


Aeroballistic Model Testing at CARDE



McGill University HARP facility – Barbados





## Operations

The time comes when every engineering design, however ingenious, must be tested at the initial production stage. The smooth transition at Computing Devices from design to production is achieved by the involvement of Production Engineering, Quality Control Engineering, and Purchasing personnel in the pre-engineering release phases of design. Problems of component securing, producibility, and assurance of fully meeting customer requirements are anticipated and accommodated.

**Manufacturing Division.** One of the best equipped facilities in the industry, Manufacturing contains an impressive array of precision machine tools and skills. To ensure the highest standards and control, we machine many of our own parts, often to tolerances as high as two tenths of a thousandth of an inch. Among our high precision machines is the Burkhardt tape-controlled jig borer.

From initial assembly, subassembly in the "green room" to final assembly in the "white room", all materials and parts are handled with the same care and skill displayed during fabrication.

**Quality Control Division.** Our Quality Control engineers apply their specialized knowledge in the earliest design phases. They assist the systems engineers and the reliability engineers in the final working of the system model specifications, and work closely with the design engineers throughout the prototype fabrication and evaluation program.

They also review manufacturing drawings prior to release, so that obscure points may be clarified and difficult manufacturing steps made easier.

In fabrication and assembly, the primary inspection

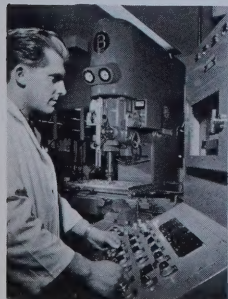
responsibility rests with the machinist or assembler. Pride of workmanship — making something right the first time — is a powerful factor in our aim for zero defects. Quality Control inspectors examine parts and subassemblies on a scientifically computed sampling basis, allowing them to ensure the high quality of a product.

All units are tested singly and as complete systems under the most adverse operating conditions — from frigid arctic temperatures to near the boiling point of water; from sea level to nearly 100,000 feet above; in atmospheres approaching 100 per cent relative humidity; under corrosive salt spray; or the vibration "torture rack", where they are shaken far more severely than they will be in actual use. Units which pass these stringent tests can be relied upon to perform accurately and remain trouble free for periods far beyond the design minimums.

**Materials Division.** Our Material Division personnel are responsible for procurement, stores and Material Control. They are entrusted with the problem of maintaining the optimum balance between the requirements of quality, the demands of production schedules, and the need to minimize costs. This is a difficult job for any type of manufacturing. For the precision electro-mechanical type of manufacturing that we do at *Computing Devices*, it is a particularly difficult task, since a 99 per cent effectiveness at having "the right materials at the right place at the right time" may leave dozens of critical parts unavailable when needed.



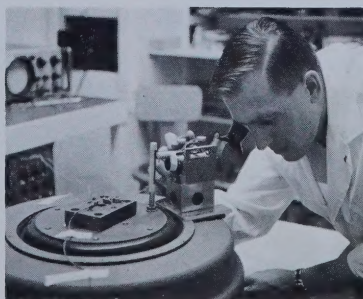
Subassembly being checked on a card-programmed dynamic tester.



Burkhardt Jig Mill and Control Panel



Wiring Loom Assembly



Environmental Test Chamber



Electrical Assembly Area



## Commercial

The Commercial Group is an autonomous organization established to meet the Company's expanding operations in the non-military field, having its own Sales, Engineering, Manufacturing, Service and Administrative functions.

Its present principal activities include Avionics, Marine and Survey, Industrial and Scientific Instrumentation. In addition to marketing products based on its own designs, the Group also manufactures under licence and handles the Canadian representation of major US and Overseas manufacturers. Facilities are located in Ottawa, Montreal, Toronto, Halifax and several points in the Maritimes and Newfoundland.

The Group is highly flexible and geared to carry out the Company's plans to develop and manufacture diversified products to serve Commercial and Industrial markets in Canada and throughout the world.

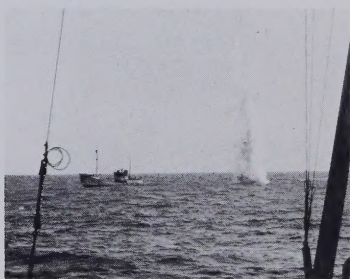
Typical of the products in which this group is involved are: Infra-Red Airborne Scanners, Telecommunications Systems, Fisheries Research, Airborne and Marine Navigation and Data Systems, Digital and Analog Systems Simulators, Data Handling Equipment, Electronic and Optical Systems for Oceanography.



An engineer calibrating a Decca Survey System in use by the Department of Mines and Technical Surveys in the Canadian Arctic.



Engineering personnel performing maintenance on an airborne weather radar system in our technical services laboratory.



Seismic survey activities controlled by navigation equipment supplied and operated by our marine division.



Test and calibration of a PHI-tel 100 telecommunications format generator.



Forestry personnel loading the film recorder of an AFDS 2 system, an airborne infra-red scanner designed to detect and map forest fires.



# Company Activities

## NAVIGATION SYSTEMS

AN/UYK-501 Digital Navigation Computer  
PHI - Position and Homing Indicator  
ANTAC - Air Navigation and Tactical Control System  
GAINS - Global Airborne Integrated Navigation System  
SKYLINE - Across-Track, Along-Track Air Navigation Computer  
CHS - Central Heading System  
SACC - Synchronous Astro Compass Controller System  
AGE - Aerospace Ground Support Equipment

## ELECTRO-OPTICAL SYSTEMS

Marine, Portable Precision Navigation Systems  
Ground Support Equipment  
Photo Reconnaissance Systems  
Airborne Infrared Fire Detection System

## DISPLAYS

Moving Map Display  
Head-Up Display  
Tactical Data Display  
Integrated Display of Situation Indicator

## SPACE SCIENCES

Aerodynamics and Ballistics  
Fluid Mechanics  
Gas Dynamics  
Thermo Aerodynamics  
Ballistic Ranges  
Ballistic Range Instrumentation  
High 'g' Telemetry  
Hypervelocity Impact Studies  
Re-entry Studies  
Space Exploration Systems and Subsystems  
Advanced Structures R & D  
Installation, Operation and Maintenance of Range Stations  
Range Management Services  
Electro-Optics  
Future Systems R & D

## SYSTEM DESIGN, DEVELOPMENT AND MANAGEMENT

Advanced Systems Engineering  
Product Design and Development  
Avionics System Management  
Undersea Warfare Detection and Fire Control Systems  
Command and Control Systems

## MANUFACTURING

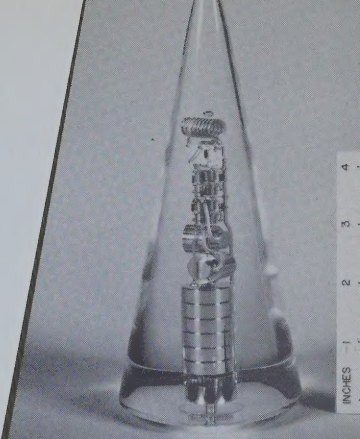
Precision production to Mil Standards  
Government Approved Quality Control  
Environmental Test Facilities

## COMPUTER CENTER SERVICES

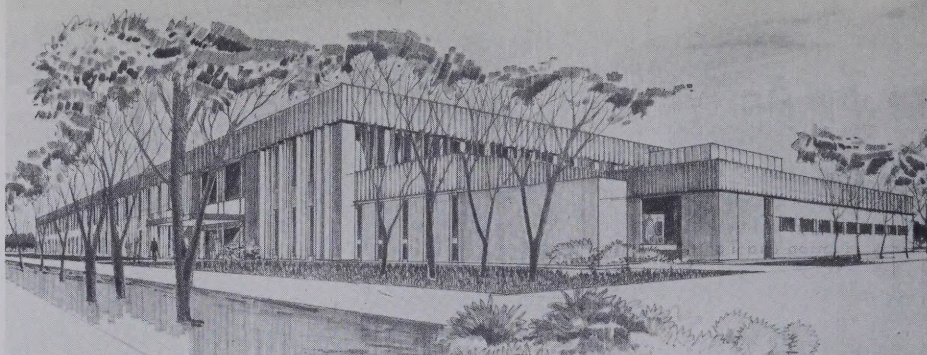
Data Processing Facilities  
Scientific Data Reduction and Analysis  
Special Purpose Programming  
General Purpose Digital Computer  
Commercial Data Processing Systems

## SERVICES

Oceanographic and Hydrographic Surveys  
Polar Shelf Exploration  
Technical Assistance and Supervision  
Technical and Operational Training  
Repair and Overhaul  
Technical Manuals







Our new Research and Development Building

### CANADIAN OFFICES

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**BENDIX INTERNATIONAL OPERATIONS**  
605 Third Avenue,  
New York, N.Y., 10016, U.S.A.  
Telephone: 973-2121 - Area Code 212  
Telex: 001-2237  
Cable address: BENDIXINT NEW YORK

### LICENSEES

**BENDIX RADIO DIVISION,  
THE BENDIX CORPORATION**  
Baltimore, Md., U.S.A.

**AIR EQUIPEMENT**  
Paris, France

**OTTICO MECCANICA ITALIANA**  
Rome, Italy

**TELDIX LUFTFAHRT-AUSRÜSTUNGS**  
G.m.b.H.,  
Heidelberg, West Germany

**Computing Devices**  
**OF CANADA LIMITED**  
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AN AFFILIATE OF THE BENDIX CORPORATION

